Regional disparities in development in Morocco: Statistical analyses using dispersion indicators and multidimensional techniques

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Abstract :

Regional disparities constitute a real socio-economic problem, reflecting an inequitable distribution of resources and opportunities on the population of the same country, with disastrous economic, social and political consequences. The objective of this article is to extend the discussion on regional disparities, by focusing on the socio-economic dimensions, we have opted for unidimensional statistical approaches by highlighting the distribution and dispersion of a set of socio-economic indicators covering education and employment, health, housing conditions and poverty and living standards; and multidimensional techniques that allowed us to design a synthetic regional development indicator, classify the regions according to the level of development, highlight the gaps and finally draw a development map in Morocco. The analysis of regional disparities through the distribution of the values of the elementary indicators, then the composite social development index, and the regional development mapping shows that, despite the progress made, the regions have not benefited in the same proportions, and the size of the gaps recorded between the best performing regions and the worst performing regions confirms the structural nature of these disparities.

Keyword: spatial disparities, inequalities, regional development, dispersion indicator, multidimensional analysis, education, health, employment, development index

I- Introduction :

Regional disparities are a real socio-economic problem, reflecting an inequitable distribution of resources and opportunities on the population of the same country, with disastrous economic, social and political consequences, because, in addition to their direct impact on the population of the most disadvantaged regions, which find themselves in a vicious circle of difficult living conditions characterised by the multiplication and reproduction of deprivation, lack of access to resources and exclusion from access to basic rights, spatial disparities consolidate feelings

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of frustration and injustice, which calls into question the social contract and threatens social cohesion. Thus, from a pragmatic point of view, it is indisputable that aggregate development at the national level is very important, and constitutes the main source of development for all socio-demographic categories, but the equitable distribution of the fruits of this development is a major condition for a sustainable socioeconomic model.

In this sense, while Morocco has been able to make relatively considerable progress in human development, by systematically reducing poverty and vulnerability rates in all its forms, and by improving the population's access to basic social infrastructure, and by supporting economic activity either through sectoral plans, or through targeted programmes to support income-generating activities, the development gaps between the regions remain very wide, which has resulted in recent years in popular movements that mainly challenge territorial disparities in development and demand that their territories be equipped with basic infrastructure and the socio-professional integration of their young people. In this context, it should be recalled that advanced regionalization constitutes one of the major pillars of the new Moroccan development model, in the sense that the country's public authorities have as an ambitious project to give maximum autonomy to the regions to manage their resources, boost their economies at the local level and be responsible for the human development of their populations, through participatory democracy mechanisms that allow the population of each region to take the initiative and actively participate in the development strategies of their territories. All this leads us to put the issue of regional disparities at the heart of the recent debate on the obstacles to reforming the development model.

The objective of this article is to extend the discussion on regional disparities by focusing on socio-economic dimensions, for this reason we have opted for unidimensional statistical approaches by highlighting the distribution and dispersion of a set of socio-economic indicators covering 4 dimensions: education, health, employment, housing conditions and poverty and living standards; and multidimensional techniques that allowed us to design a synthetic regional development indicator, classify the regions according to the level of development, highlight the gaps and finally draw a development map in Morocco. The data used are extracted from the High Commission's surveys and census covering the period 1999-2017, which made it possible to carry out a dynamic analysis of regional development disparities. To this end, we proceeded as follows: in a first section we reviewed a brief literature review on the questioning of territorial disparities and their measurement in different countries and in Morocco, then in a second section we developed our own analysis of regional disparities in Morocco, first through a

unidimensional analysis of the distribution and dispersion of socio-economic indicators, and second through the use of factor analysis techniques to construct a composite regional development index.

II- Literature review:

2-1- Overview of recent studies of regional disparities :

In the economic literature, regional inequalities have been discussed by several currents and disciplines, their existence is indisputable, however their sources and the role of public authorities in their reduction is not unanimously agreed. In fact, the neoclassics represented mainly by Solow in his famous theory of regional convergence consider regional disparities as a normal phenomenon in the market process and that they are automatically reduced in the long term by the proper functioning of the market. On the other hand, Myrdal, like interventionist economists, speaks of the notion of divergence, and highlights a process of causality that leads to a reproduction of regional inequalities, which means that in the long term spatial gaps tend to widen. However, it should be noted that these two theories remain limited to the field of economic inequalities. However, over the last three decades, the paradigms of human development, social equity and equal opportunities have aroused more interest among economists and public decision-makers than the simple notions of economic growth, GDP per capita and income equality, and it is in this sense that the recent literature on spatial disparities has seen an increase in the number of studies that focus on the social dimensions of regional inequality.

Patel 1991 was one of the first researchers to draw attention to the links between regional economic inequalities and the well-being and socio-economic conditions of the population. Since then, we have witnessed more and more detailed work trying to quantify these inequalities and highlight their determinants and interactions with other socio-economic phenomena.

In this context, Ahuluwalia (2000) highlighted the importance of regional disparities in economic performance in India, and suggested that these disparities are the result of inequalities in socio-economic development factors; starting from the Gini coefficient, he compared the pre- and post-reform periods and analysed the performance of the different regions in terms of per capita income, literacy, infrastructure, poverty and private investment. The study found that regional income disparities increased further in the post-reform period, with the coefficient of variation in income growth rates increasing from 15% in the 1980s to 27% in the 1990s. He

also explained the reasons for the superior performance of some regions: investment growth, literacy levels, infrastructure quality, the political environment and governance.

Thus Bradshaw and Vartapetov (2003) conducted a relevant study on socio-economic inequalities in Russia, their approach was multidimensional using a multitude of socio-economic variables such as level of education, access to infrastructure, infant mortality, level of consumption, employment, and income,they measured inequalities by applying the coefficient of variation and decompositions of the Theil index to simple and composite indicators and they proved the existence of two types of regional inequalities: the first brings together converging indicators, which means that the gaps are becoming less and less important, the second brings together diverging indicators, whose gaps are becoming more and more important.

Petrakos G., Artelaris P. (2008) studied regional inequalities between 51 Greek regions during the period 1981-2004. They considered that GDP per capita is not a very good indicator of regional well-being and that an exclusive focus on this index is not very informative and could give a misleading picture of regional inequalities. To address this deficiency, they proposed a composite development and prosperity indicator (PRI) designed to include the different dimensions of regional quality of life and well-being. Their analysis led to two main conclusions. First, the level of regional inequalities in the composite indicator of development and prosperity is still higher than that of the corresponding GDP per capita. Secondly, the dynamic analysis shows that there is no regional catching-up process either for GDP per capita or for the composite indicator of development and prosperity.

Winkler, Andreas (2012) used factor analysis methods to design a regional socio-economic pressure index in Syria, which synthesized regional disparities represented in 25 variables combining the spheres of population structure, economy, employment, infrastructure, pre-school education and health care, the results highlighted the existence of striking spatial disparities in Serbia, between regions, and between urban and rural.

The study by Deeptha Wijerathna and All (2014) assessed regional disparities in economic growth in Sri Lanka using a range of statistical measures such as Sigma convergence, coefficient of variation, Gini coefficient and average deviation scores. The results of this study, which covers the period from 1996 to 2011, show that regional growth inequalities are considerable. Thus, trend analysis over this 16-year period indicates that while some convergence process has taken place since 2000, this convergence (conditional and

unconditional) is not statistically significant. Indeed, the results suggest that, on current trends, it will take 15 years to halve the current inequality and about 30 years to achieve balanced growth at the regional level.

In a very original study on quantitative techniques used, Peng Bin (2016) studied the transient dynamics of regional disparities in China over the period 1998-2010. By comparing the socio-economic performance of 30 regions using a multidimensional index based on stochastic nucleus density. The multidimensional index contains five dimensions for reporting on the different areas of socio-economic development: macroeconomic performance, science and innovation, environmental sustainability, human capital and public facilities. This experimental study reveals the existence of a three-summit convergence pattern between 1998 and 2010 and provides a better understanding of the evolution of regional disparities in China in terms of overall socio-economic development.

In another context, Summerina Wasim & Kashif Munir (2017) analysed the dynamics of social inequalities at the inter-regional and intra-regional level in Pakistan before and after decentralization; they focused on health and education indicators, so they made a comparison of inequalities before and after decentralization, using coefficients of variation and the Theil index to measure spatial inequalities, and they used the decomposition of the Theil index to deduce the sources of these inequalities. The results indicate a wide disparity in the education and health sectors at the interprovincial and intra-regional levels. The decomposition of educational inequality indicates an improvement at the provincial level. Also, inequalities in women's health have been reduced during the period of decentralization. In general Decentralization has slightly improved the situation in all areas; however, the effect on disparities remains minimal, economic and social policies should be more appropriate and targeted, which would help to eliminate the problem of regional inequalities and develop lagging areas.

2-2- Studies on regional disparities in Morocco

As for the Moroccan case, apart from the small number of relevant scientific studies on the issue of regional disparities, it is still present in public debate and political discourse. Thus, the last decade has been marked by a multiplication of institutional reports that deal with the different dimensions of regional disparities in Morocco.

In this context, in 2018 the Office of the High Commissioner for Planning published the new version of the regional assessment, a report rich in statistical information and analysis of socio-

economic indicators at the regional level based on data from several surveys (the national employment survey (annual from 2000 to 2017), and the surveys on household consumption and living standards (2001 2007 and 2014)) and the general population and housing censuses (2004 and 2014). The published analysis consists firstly of simple indicators that measure the performance of regions in all socio-economic dimensions contained or calculated from the surveys cited, namely employment, education, health, demography, housing conditions, poverty, vulnerability, inequality, and GDP per capita, secondly they have designed three composite indices, the Human Development Index (HDI), the Human Exclusion Index (HDI) and the Socio-economic Deficit Index (SESI). These indices make it possible to aggregate several demographic and socio-economic dimensions and to Range regions according to the level of human and socio-economic development. Thirdly, a model that has made it possible to assess the reduction of inequalities over time by using the Solow model to test and quantify the convergence process of the various social and economic development indicators. The main results show that if performance is positive for all regions in the different indicators. In terms of human development (HDI), there was an improvement in the HDI between 2004 and 2014, of the order of 1.7% at the national level. All regions have benefited from this development progress, but disproportionately. This means that the process of reducing regional disparities in human development is not happening at the same pace at the regional level. Overall, with reference to the process of convergence of the various social aggregates through the use of composite indices of social and human development, it appears that there is no overall movement towards convergence from the less developed to the more developed regions. Thus, regional convergence in human development has been a very slow process (27 years) to halve regional disparities and the rate of reduction of interregional social deficits between 2001 and 2017 is insufficient to create a multidimensional convergence process.

In this sense we can also mention the report of the National Observatory for Human Development in 2017 which consists in a regional analysis of territorial disparities in social development in Morocco, the methodology of the report consisted in constructing a local development index, inspired by the HDI, from which they have chosen 2 dimensions: education and health, but with indicators better adapted to the situation in Morocco and available at sub-national levels. For the health dimension, the indicator used is the medical supervision rate measured at the provincial level. For the education dimension, the indicator used is the success rate at the end of the college cycle, which is measured at the circle level. The SDI then constitutes a synthetic measure of the performance of each of the indicators mentioned at the

regional and provincial levels, the data used come from the series of panel surveys on household living standards carried out biannually from 2014 onwards, which made it possible to map social development by region and province, measure the social deficit, decompose the components of this deficit, and highlight territorial disparities, the results showed that more than half of the regions of the Kingdom have social development indices higher than the national average, with the regions of Casablanca-Settat and Rabat-Salé-Kénitra at the top of the list, so a third of the regions have deficiencies of less than 10% compared to the national average, with the exception of the Drâa-Tafilalet region, which requires priority interventions in terms of social development; at the provincial level, only 44% of the Kingdom's prefectures/provinces are in a good situation in terms of social development with the prefectures/provinces of Rabat, Guelmim and Es-smara, which are almost twice the national score. They have also led to the detection not only of regions in social deficit but also of the prefectures/provinces that suffer most from it and which represent more than half of the prefectures/provinces in our country. The provinces of Aousserd, Youssoufia, Driouch, Taounate, Chefchaouen and Sidi Bennour are the most affected. The components of social development addressed in this territorial diagnosis also reveal significant gaps. Indeed, students from 52 prefectures/provinces, or 70% of Moroccan prefectures/provinces, are lagging behind the national average for the completion of the college cycle. 56% of prefectures/provinces are in significant deficiencies with regard to their school indices, of which 52% are in manifest deficiencies in terms of health.

On the academic level, Rachid El Ansari (2009) published an article on regional dynamics and unequal development, whose links he tried to highlight between urbanization structures, land use planning, and industrialization on spatial disparities in Morocco, by comparing a set of socio-economic indicators such as GDP, activity and unemployment, schooling, and literacy and consumer spending, he demonstrated that the development model in Morocco is geographically unequal on several levels, so that the dynamics of national development is accompanied by a process of geographical concentration of wealth, employment poles, and basic infrastructure, its analysis of the determinants of spatial inequalities has highlighted 3 essential factors: urbanization, migration, and the location of activities that depend on the location of facilities, it concluded with very interesting recommendations "The results of this research show that urbanization is an inevitable consequence of development, which promotes the fragmentation of space and the concentration of populations and activities. But also that regional disparities are the product of an unbalanced distribution of development. Spatial

planning policies, where they exist, -this is not the case in Morocco- act retrospectively to correct these socio-spatial inequalities. The reduction of regional disparities requires a redefinition of the role of economic areas. On the one hand, in the rural world, where the transformation of structures and the reduction of gaps between the modern and traditional sectors must be accompanied by the training and mobilization of men. On the other hand, in the urban world, where the state of concentration of the network must evolve towards decentralized forms of organization, integrated at the regional level and users of labour".

On the other hand, we find the work of Jabrane Amagous and Aomar Ibourk (2016) whose spatial disparities in schooling in Morocco they studied, using data from the general population and housing censuses they identified 3 provincial education indicators of quantity, quality and inequality, and they calculated a multidimensional indicator, the application of spatial econometric methods to these indicators has shown that there are wide disparities between provinces in terms of quantitative and qualitative performance of education, but the convergence test has highlighted the existence of convergence processes, and that it must be consolidated by more geographically targeted public education policies.

III- Quantitative analysis of regional development disparities in Morocco

This second section is our main contribution to the political and academic discussion around regional disparities in Morocco, we present a quantitative analysis of the issue under two complementary parts, the first consists of an elementary exploitation of regional socio-economic indicators with the application of unidimensional analysis techniques to highlight regional development gaps, then in the second part we used multidimensional analysis techniques to construct a composite index to synthesize the information contained in the elementary variables and give an overall idea of regional disparities in development, determine their sources, and map them in order to target the regions with the most obvious delays

3-1- Analysis of regional disparities by basic socio-economic indicators:

In this first part of the quantitative analysis we present the regional performances of 10 socio-economic development indicators covering 4 dimensions: education and employment, housing conditions, health, poverty and standard of living, so to visualize the disparities we have calculated 3 dispersion indicators, namely Range, standard deviation and interquartile deviation, in addition to having an idea on the dynamics of development we have calculated the

absolute and relative deviations between 2 time points. The results are presented and discussed in the tables and paragraphs below.

3-1-1- Education and employment:

Literacy indicator:

Despite increased efforts to reduce illiteracy, national trends remain very poor, yet regional disparities are minimal and tend to decrease, while the national average for literacy has increased from 57% in 2004 to 67% in 2014, 5 regions have a rate above or equal to the average (compared to only 3 in 2004), Casablanca-Settat is the most efficient region with a literacy rate of 72%, while the worst performance is recorded in Benimelal-Khenifra with a rate of 60%, with regard to dispersion indicators the Range does not exceed 13%, the interquartile gap is 6%, so the standard deviation is 4.5%, this reflects a low level of regional disparities in this field.

Table 01: Evolution of the literacy rate of the 10 years old and over (in %)

Region		2004	2014	Difference
Tangier-Tetouan-Al Hoceima		56,6	68,2	11,5
Oriental		56,1	67,1	10,9
Fez-Meknes		55,5	64,1	8,6
Rabat-Salé-Kénitra		61,5	70,8	9,3
Blessed Mellal-Khenifra		49,8	60,4	10,6
Casablanca-Settat		65,0	72,9	7,9
Marrakech-Safi		48,6	60,9	12,4
Daraa-Tafilalet		54,6	65,3	10,6
Sub-Massa		53,9	65,4	11,5
Southern Regions		62,1	72,2	10,1
Total Total		**57,0**	**67,1**	**10,1**
Dispersion indicators	**Range**		13%	
	Interquartile spacing		6%	
	Standard deviation		4,5%	

Source: RGPH 2004 & 2014, HCP.

School enrolment indicator:

As regards the gross enrolment rate, the evolution recorded is largely positive, either at the level of overall improvement or at the level of disparity reduction, in fact the Gross Enrolment Rate at all levels combined has increased from 57% in 2001 to 80% in 2017, Thus in 2017 6 regions recorded a rate higher than or equal to the average, the best performance is recorded in the

southern regions with a GER of 86.8%, while the lowest rate is 74.5% recorded in Marrakech-Safi, so the Range is 12.4%, the interquartile gap is 8.8%, the standard deviation is 5%; This reflects a moderate level of regional disparities in enrolment, a more focused analysis shows that these inequalities concern mainly qualifying secondary education, and higher education.

Table 02: Gross enrolment rate at all levels combined (in %)

Region	2001	2017	Difference
Tangier-Tetouan-Al Hoceima	51,7	76,0	24,3
Oriental	57,0	77,6	20,6
Fez-Meknes	53,3	79,8	26,5
Rabat-Salé-Kénitra	59,2	84,8	25,6
Blessed Mellal-Khenifra	52,5	75,6	23,1
Casablanca-Settat	64,1	84,8	20,7
Marrakech-Safi	50,5	74,5	24,0
Daraa-Tafilalet	60,0	79,7	19,7
Sub-Massa	60,0	82,3	22,3
Southern Regions	72,1	86,8	14,7
Total Total	**57,0**	**80,2**	**23,2**
Dispersion indicators			
Range		12,4%	
Interquartile spacing		8,8%	
Standard deviation		5%	

Source: National Employment Survey 2001 & 2017, HCP.

Unemployment Indicator :

Concerning the unemployment rate, the evolution is very minimal, so regional disparities remain very high, at the national level the rate has risen from 12.3% in 2001 to 10.2% in 2017, so 5 regions have a level lower than the national average, the Eastern is the region with the highest unemployment rate (12.9%) while Beni Mellal-Khenifra has the lowest unemployment rate, in terms of dispersion indicators, the Range is 11.2% (higher than the national average), the interquartile gap is 5.7%, while the standard deviation is 3.1%, these values are very large compared to the average, which reflects very large regional disparities in terms of employment.

Table 03: Unemployment rate (%)

Region	2001	2017	Difference
Tangier-Tetouan-Al Hoceima	9,7	8,2	-1,5
Oriental	18,2	17,1	-1,1
Fez-Meknes	8,8	9,5	0,7
Rabat-Salé-Kénitra	14,8	12,9	-1,9
Blessed Mellal-Khenifra	9,9	6,1	-3,8
Casablanca-Settat	15,5	11,3	-4,2
Marrakech-Safi	9,6	7,2	-2,4
Daraa-Tafilalet	7,8	6,0	-1,8
Sub-Massa	9,7	9,8	0,1
Southern Regions	19,8	13,1	-6,7
Total Total	**12,3**	**10,2**	**-2,1**

	Range	11,2%
	Interquartile spacing	5,7%
	Standard deviation	3,1%

Source: National Employment Survey 2001 & 2017, HCP.

3-1-2- Housing condition :

Indicator of access to the drinking water network

While the connection to the drinking water network has improved considerably at the national level, spatial disparities still persist, in fact at the national level the connection rate to the drinking water network has increased from 64.7% in 2001 to 84% in 2017, the Draa-Tafilalt region is the region most connected to drinking water with a coverage rate of 93%, while the minimum coverage rate is 75% in Tangier-Tetouan-Al Hoceima, thus 5 regions have a rate higher than the national average, concerning the dispersion indicators the Range is 18% the interquartile gap is 11.1%, the standard deviation is 6%, these dispersion indicators are considerably high this reflects significant and persistent regional disparities in access to water.

Table 04: Proportion of households with access to drinking water from the network (%)

Region		2001	2017	Difference
Tangier-Tetouan-Al Hoceima		59,7	74,9	15,2
Oriental		60,8	78,5	17,7
Fez-Meknes		66,2	81,2	15,0
Rabat-Salé-Kénitra		76,4	84,8	8,4
Blessed Mellal-Khenifra		57,2	78,7	21,5
Casablanca-Settat		76,9	88,3	11,4
Marrakech-Safi		49,3	82,9	33,6
Daraa-Tafilalet		57,7	92,8	35,1
Sub-Massa		59,4	91,3	31,9
Southern Regions		65,8	89,8	24,0
Total Total		**64,7**	**83,9**	**19,2**
Dispersion indicators	**Range**		18%	
	Interquartile spacing		11%	
	Standard deviation		6%	

Source: National Employment Survey 2001 & 2017, HCP.

3-1-3- Indicator for connection to public sewer networks

The evolution of household connection to public sewer networks is very slow, so regional disparities in this area are very significant and persistent, in fact the national rate of households connected to public sewer networks has increased from 52.4% in 2001 to 61.6% in 2017, at the regional level the coverage rate of the highest (rep) is recorded in the southern region (75%), while the lowest coverage is that recorded in Daraa-Tafilalet (36%), which is almost half the

highest rate, thus the Range is 39%, the interquartile range is 25.1%, the standard deviation is 13.3%, these very high dispersion values can only reflect a flagrant level of regional disparities in the connection to public sewer networks.

Table 05: Proportion of households connected to public sewer networks (%)

Region		2001	2017	Difference
Tangier-Tetouan-Al Hoceima		56,6	64,5	7,9
Oriental		51,3	61,8	10,5
Fez-Meknes		54,9	64,5	9,6
Rabat-Salé-Kénitra		62,9	72,6	9,7
Blessed Mellal-Khenifra		44,8	49,3	4,5
Casablanca-Settat		66,9	72,3	5,4
Marrakech-Safi		40,5	46,4	5,9
Daraa-Tafilalet		25,2	35,8	10,6
Sub-Massa		35,2	47,2	12,0
Southern Regions		46,5	74,9	28,4
Total Total		**52,4**	**61,6**	**9,2**
Dispersion indicators	**Ran**	35%		
	Interquartile spacing	29%		
	Standard deviation	13%		

Source: National Employment Survey 2001 & 2017, HCP.

3-1-4 Health :

Indicator of access to medical consultations:

The evolution of the medical consultation rate is so low, so it is more or less unequal, in fact at the national level the rate of medical consultations has increased from 83% to 85% in 13 years (between 2004 and 2017) which is very modest, the highest rate in 2017 is recorded in the Casablanca-Settat region (94,2%), the regions of Tangier-Tetouan-Al Hoceima, Rabat-Salé-Kénitra, recorded rates higher than 90%, while the lowest frequencies of medical consultations are recorded in the Sous-Massa and Daraa-Tafilalt regions with respective rates of 67.2% and 66.8%. Concerning the dispersion indicators, the value of the Range is considerable (27%), thus the interquartile gap is 29%, the standard gap is 19%, these indicators reflect a relatively moderate level of inequality in terms of access to medical consultations.

Table 06: Proportion of households accessing medical consultations

Region	2004	2017	Difference
Tangier-Tetouan-Al Hoceima	82,7	93,1	10,4
Oriental	52,0	86,4	34,4
Fez-Meknes	83,8	87,4	3,6
Rabat-Salé-Kénitra	91,3	90,8	-0,5
Blessed Mellal-Khenifra	92,4	72,2	-20,2
Casablanca-Settat	88,5	94,2	5,7

	Marrakech-Safi	80,4	89,2	8,8
	Daraa-Tafilalet	78,9	66,8	-12,1
	Sub-Massa	78,2	67,2	-11,0
	Southern Regions	90,8	79,9	-10,9
	Total Total	82,9	85,0	2,1
Dispersion indicators	**Range**		27%	
	Interquartile spacing		19%	
	Standard deviation		11%	

Indicator of access to supervised childbirth:

Access to supervised childbirth has improved significantly over the past decade, but this improvement has not affected all regions, and it was stronger in regions where the level was already higher in 2004. in fact at the national level the rate of supervised childbirth has gone from 44.9% to 72.9%, in 2014 the highest rate is 82.6% and is recorded in the Casablanca-Settat region this rate and 1.8 times higher than that recorded in the Daraa-Tafilalet region (45.1%), thus the indicators of dispersion indicate a considerable level of inequality, especially the Range, which stands at 37.5% while the standard deviation does not exceed 11% and the interquartile deviation recorded in 2014 is 9.8%, yet the analysis of the series shows that there is a clear convergence of regional rates of supervised deliveries and that the Daraa-Tafilalt region is the only exception.

Table 07: Proportion of supervised deliveries

Region		2004	2017	Difference
Tangier-Tetouan-Al Hoceima		28,7	66,8	38,1
Oriental		55,4	71,8	16,4
Fez-Meknes		36,1	68,9	32,8
Rabat-Salé-Kénitra		58,5	78,2	19,7
Blessed Mellal-Khenifra		42,7	75,8	33,1
Casablanca-Settat		68,3	82,6	14,3
Marrakech-Safi		33,3	70,2	36,9
Daraa-Tafilalet		43,7	45,1	1,4
Sub-Massa		39,0	78,7	39,7
Southern Regions		50,1	80,1	30,0
Total Total		44,9	72,9	28,0
Dispersion indicators	**Range**			37,5%
	Interquartile spacing			9,8%
	Standard deviation			11%

3-1-4- Poverty and standard of living:

Monetary poverty:

The reduction in income poverty over the last decade is evident, so this reduction is recorded in all regions but at different rates, in fact the income poverty rate at the national level has decreased from 15.3% in 2004 to 4.8% in 2014, at the regional level 6 regions have a poverty rate higher than the average rate at the national level, so the lowest income poverty levels are recorded in Casablanca-Settat (2%) and Tangier-Tetouan-Al Hoceima (2,2%), while the highest rates are recorded in Daraa-Tafilalet (14.6%) and Beni Mellal-Khenifra (9.3%), the dispersion indicators indicate the persistence of regional inequalities in monetary poverty, in fact the Range is 12% (2.5 times higher than the national poverty rate), the interquartile gap is 2%, and the standard gap is 4%,

Table 08: Income poverty rate

Region		2001	2014	Difference
Tangier-Tetouan-Al Hoceima		11,5	2,2	-9,3
Oriental		18,2	5,3	-12,9
Fez-Meknes		16,6	5,2	-11,4
Rabat-Salé-Kénitra		15,5	3,8	-11,7
Blessed Mellal-Khenifra		14,4	9,3	-5,1
Casablanca-Settat		6,9	2	-4,9
Marrakech-Safi		20,2	5,4	-14,8
Daraa-Tafilalet		40,3	14,6	-25,7
Sub-Massa		16,7	5,1	-11,6
Southern Regions		6	3,3	-2,7
Total Total		**15,3**	**4,8**	**-10,5**
Dispersion indicators	**Range**			-12%
	Interquartile spacing			2%
	Standard deviation			4%

Multidimensional poverty:

In turn, multidimensional poverty has declined significantly over the last decade, this decline is general in all regions but this does not prevent inequalities in terms of multidimensional poverty from persisting; in fact, while the national MP rate fell from 25% in 2004 to 8.2% in 2014, at the regional level the rates recorded in 2014 range from 4.1% in the southern regions to 13.4% in the Casablanca-Settat region in Beni Mellal-Khenifra. On the other hand, the dispersion indicators reflect a moderate level of regional inequalities: in fact, the Range does not exceed 10%, the interquartile gap is 4%, and the standard deviation is 3%.

Table 9: Multidimensional poverty

Region	2001	2014	Difference
Tangier-Tetouan-Al Hoceima	30,3	9,5	-20,8
Oriental	23,5	9,5	-14
Fez-Meknes	25,9	9,6	-16,3
Rabat-Salé-Kénitra	21,9	6,1	-15,8
Blessed Mellal-Khenifra	31	13,4	-17,5
Casablanca-Settat	17,5	4,1	-13,4
Marrakech-Safi	34	11,3	-22,7

Daraa-Tafilalet		25,3	10	-15,3
Sub-Massa		23,5	7,2	-16,4
Southern Regions		16,1	4,1	-12
Total Total		**25**	**8,2**	**-16,8**
Dispersion indicators	**Range**			9,3%
	Interquartile spacing			4%
	Standard deviation			3%

Consumer spending:

Annual per capita consumption expenditure increased sharply between 2001 and 2014, at national and regional level, in fact the average value of per capita consumption expenditure increased from 8280 DH in 2001 to 15875 DH in 2014, yet the highest value in 2014 is that of the Casablanca-Settat region (19006 DH) while the lowest value is that of the Beni Mellal-Khenifra region (11745 DH). However, the dispersion indicators reflect a considerable level of regional inequalities in consumer spending: in fact, the Range is 7290 DH or 40% of the national average, the interquartile gap is 5000 DH, and the standard deviation is 2606 or more than 25% of the average

Table 10: Per capita consumption expenditure

Region		**2001**	**2014**	Difference
Tangier-Tetouan-Al Hoceima		8402,078	17082,375	-20,8
Oriental		6882,9732	15971,865	-14
Fez-Meknes		7460,3746	14880,077	-16,3
Rabat-Salé-Kénitra		8453,0591	17716,75	-15,8
Blessed Mellal-Khenifra		7296,9821	11745,458	-17,5
Casablanca-Settat		11487,38	19006,439	-13,4
Marrakech-Safi		6393,6695	13575,296	-22,7
Daraa-Tafilalet		4862,2682	11922,503	-15,3
Sub-Massa		8239,893	13997,888	-16,4
Southern Regions		11810,404	18332,625	-12
Total Total		8280,1264	15875,683	**-16,8**
Dispersion indicators	**Range**		7260,981	
	Interquartile spacing		4142	
	Standard deviation		2606	

3-2- The multidimensional regional social development index:

The composite indicator allows regions to be compared and ranked by combining several indicators at the same time. This indicator has the advantage of simultaneously reporting on the totality of the multidimensional phenomenon such as education and employment, which encompasses several aspects (enrolment rate, illiteracy rate, unemployment rate), housing

conditions including access to various basic services (water, sanitation,) health (safe delivery, access to medical consultations), poverty (income poverty, multidimensional poverty).

The classification of regions according to the various simple indicators highlights many details but does not allow a synthetic conclusion to be drawn on regional disparities in socio-economic development, which complicates the geographical targeting of policies.

The quantitative nature of the variables considered to estimate the composite indicator of living standards suggests the use of the main component analysis. Such a technique makes it possible to explain or report the variance observed in the mass of initial data to a reduced number of components while ensuring minimal loss of information.

The Main Component Analysis was carried out on variables measuring income poverty at the local level, education and employment indicators and indicators of access to basic social services.

Step 1: Homogeneity test of the elementary indicators:

In order to ensure a more robust composite index, a reliability analysis of these indicators was conducted on the basis of a statistical test of homogeneity and absolute consistency (Cronbach's alpha coefficient).

It is a statistical index varying between 0 and 1 and which reflects a degree of homogeneity (internal consistency) that is all the greater (e) when its value is close to 1. The use of this test enabled us to identify 10 indicators relating to children's schooling, population unemployment, access to basic social infrastructure (electricity, water and sanitation) and access to communication and ownership of equipment (Internet, computer, refrigerator, etc.) and to exclude the illiteracy rate and the income poverty rate.

Table 09: Reliability Statistics

Alpha of Cronbach	Cronbach Alpha based on standardized elements	Number of elements
0,80	0,916	9

Table 10: Total Element Statistics

Variable	**Scale average in case of deletion of an element**	**Full correlation of the corrected elements**	**Multiple correlation square**	**Cronbach Alpha in case of deletion of the element**

Gross enrolment rate at all levels	19.665	0.686	0.627	0.775
Literacy rate	18.785	0.812	0.773	0.764
Unemployment rate	20.297	0.683	0.635	0.780
Proportion of households connected to the networks	10.348	0.932	0.855	0.723
Proportion of households with water	24.709	0.019	-0.121	0.79
Rate of medical and health consultations	17.042	0.647	0.467	0.787
Proportion of deliveries in a supervised environment	15.017	0.766	0.626	0.759
Monetary poverty	19.078	0.858	0.832	0.765
Multidimensional poverty	20.054	0.820	0.795	0.775
Proportion of households with a toilet in the municipality	19.078	0.858	0.832	0.765

From these tables, it can be seen that the 10 indicators of the different dimensions of the population's standard of living are homogeneous and consistent, since the value of the alpha coefficient 0.8 is higher than all Cronbach's alpha values if an element is deleted, as shown in Table 09 from the consistency test.

Step 2: the main component analysis:

The analysis of the ACP results (presented in the annex) shows that the first two factorial axes are largely dominant, explaining 82% of the total inertia (60% the first and 22% the second), which indicates that it would be a composite indicator largely representative of the state of regional development. This means that we can use the first axis to construct a synthetic index of 60% of the information included in the initial 9 variables.

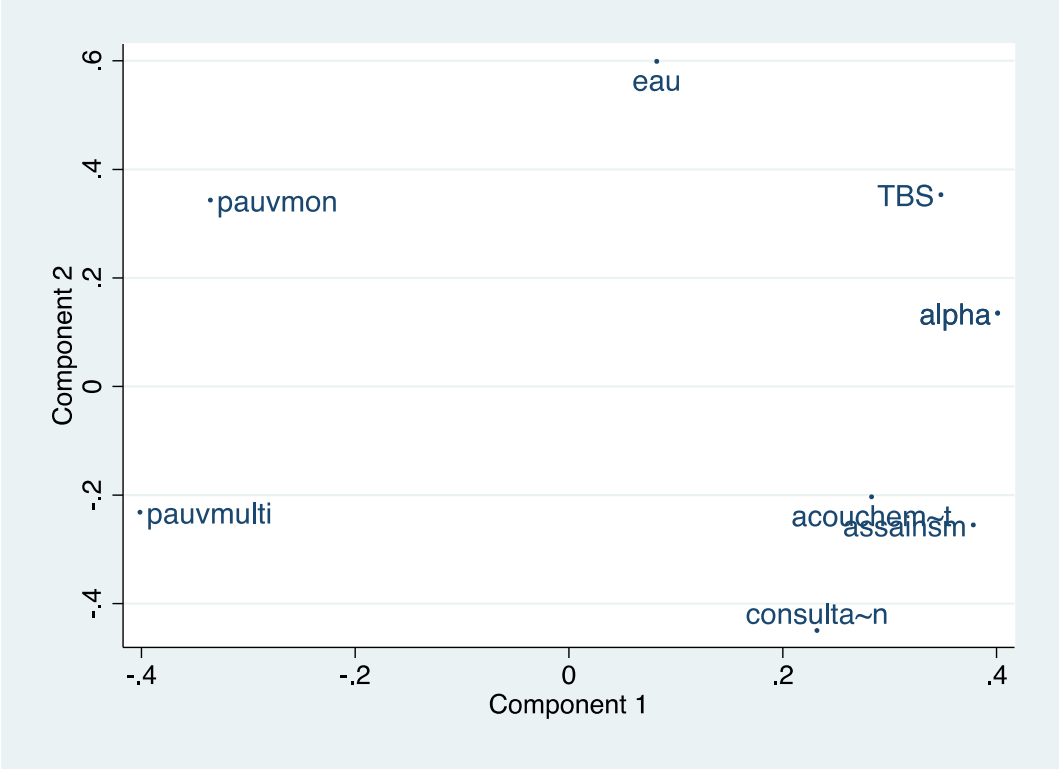
The coordinates of the variables on the first factor axis represent the weights of these variables that we will use in the next section of the composite indicator of regional socio-economic development.

Table 10: Weight allocated to each variable (coefficients of the coordinates on the first 2 and factorial axis)

Dimensions	Indicator	Relative weight axis1	Relative weight axis2
Training and Employment	**Gross enrolment rate at all levels**	0,3268	0,3654
	Literacy rate	0,3821	0,1492
	Unemployment rate	0,3008	-0,0743
Access to basic infrastructure	**Proportion of households connected to the networks**	0,2251	-0,2397
	Proportion of households with water	0,3648	0,6024

Health	**Rate of medical and health consultations**	0,2251	-0,4371
	Proportion of deliveries in a supervised environment	0,2738	-0,1921
Poverty and poverty	**Monetary poverty**	0,3226	0,3276
	Multidimensional poverty	-0,3789	-0,2466

The graph below shows the logic according to which the first axis synthesizes the information contained in the initial variables, at the sign level access to water, access to improved sanitation, gross enrolment rate, literacy rate, access to supervised childbirth, access to medical consultations is positioned at the positive part of the axis, so that their values are positively correlated with this axis; while the income poverty rate and the multidimensional poverty rate are positioned at the negative part of the axis, which means that they are negatively correlated with this axis. We can therefore clearly deduce that this axis is a monotonous function of the region's socio-economic development, in the sense that it assigns negative values when an elementary indicator performs poorly (increased access to water, access to improved sanitation, gross enrolment rate, literacy rate, access to supervised childbirth, access to medical consultations or reduction in multidimensional poverty or income poverty) and vice versa. This means that we can use the coordinates of the observations on this axis as a composite indicator of regional social development.



Step 3: Ranking of regions by level of development:

On the basis of the composite indicator of regional development thus calculated from the different weights on the first axis, we have deduced a ranking of regions according to their performance in all the dimensions of social development used in this study.

Such a ranking highlights that the "Daraa-Tafilalet" region is the most deficient in terms of social development if we take into account the different dimensions, followed by the regions "Béni Mellal-Khénifra", "Marrakech-Safi". The most efficient regions are "Casablanca-Settat", "Regions of the South" and "Rabat-Salé-Kénittra". Thus, the distribution of the index values shows that regional development disparities are very obvious. Thus the level of development of the Casablanca Settat region is 7 times better than that of "Daraa-Tafilalet", and 3 of the 5 most disadvantaged regions in terms of development achieve a relative performance 50% below the average. In addition, there are even inequalities in the high level of development between regions that perform better than average, with a difference of more than 3 points between the regions of Tangier-Tetouan-Al Hoceima, the East and the Casablanca-Settat region.

Table 11: Ranking of provinces by composite social development indicator

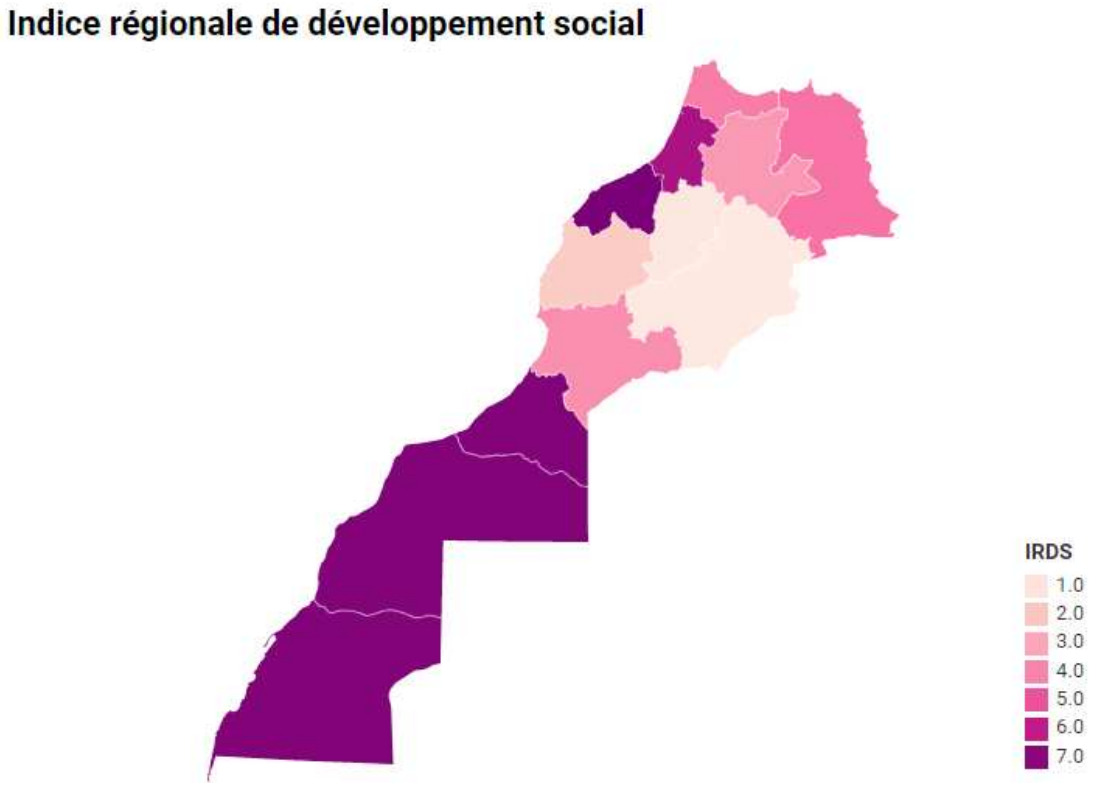
Regions	**Regional Social Development Index**	**Rank**
Casablanca-Settat	7,30	1
Southern Regions	7,12	2
Rabat-Salé-Kénittra	6,43	3
Oriental	4,41	4
Tangier-Tetouan-Al Hoceima	4,11	5
Sub-Massa	3,69	6
Fez-Meknes	3,48	7
Marrakech-Safi	1,78	8
Blessed Mellal-Khenifra	0,90	9
Daraa-Tafilalet	0,79	10

Table 11: Distribution of the regional social development index

Indicator	
Average	4
Median	3,90
min	0,79
max	7,30
range	6,51
Interquartile range	4,65

Standard deviation	2,40

Figure 1: Social development mapping 2017



Conclusion :

The analysis of regional disparities through the distribution of the values of the elementary indicators, then the composite social development index, and the regional development mapping shows that, despite the progress made, the regions have not benefited in the same proportions, and the size of the gaps recorded between the best performing regions and the worst performing regions confirms the structural nature of these disparities. This makes it difficult to talk about a process of regional convergence of social development in the medium term, it calls into question the country's territorial policy in terms of equity and largely explains the failure of the development model often hidden by average performance. Thus, many question the effectiveness and targeting of social programmes launched over the past two decades, especially the national human development initiative. By dimension we have found that access to basic infrastructure in housing and access to health are the highest dimensions or disparities, which is very alarming because these two dimensions are always linked to the daily social stress that leads to popular demands, and threatens social cohesion. On the basis of these findings, which recommend that we improve the targeting of social policies and the

prioritization of the dimensions where the gaps are the most important, but also emergency programmes and interventions in the most backward regions in terms of social develop

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